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NORTHERN GREAT PLAINS RESOURCE PROGRAM, SURFACE RESOURCES WORK GROUP. CONSTRAINTS

Northern Great Plains Resource Program

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Analyzes surface resource constraints that may limit the rate or scale of coal development in a 63 county area of North Dakota, Montana, Wyoming and South Dakota. The constraints analyzed are imposed on coal development as a result of considering other resource values. These include: 1) Statutory constraints; 2) Constraints imposed by society as a result of attitude, tradition, social and economic standards, personal taste, and desires; 3) Constraints imposed by and subject to limitations of natural processes involving both physical and biological phenomena; and 4) Constraints resulting from a lack of knowledge needed to address particular problems. The purpose is to describe various constraints that would affect the rate and scale of coal extraction and conversion of coal to other energy forms.

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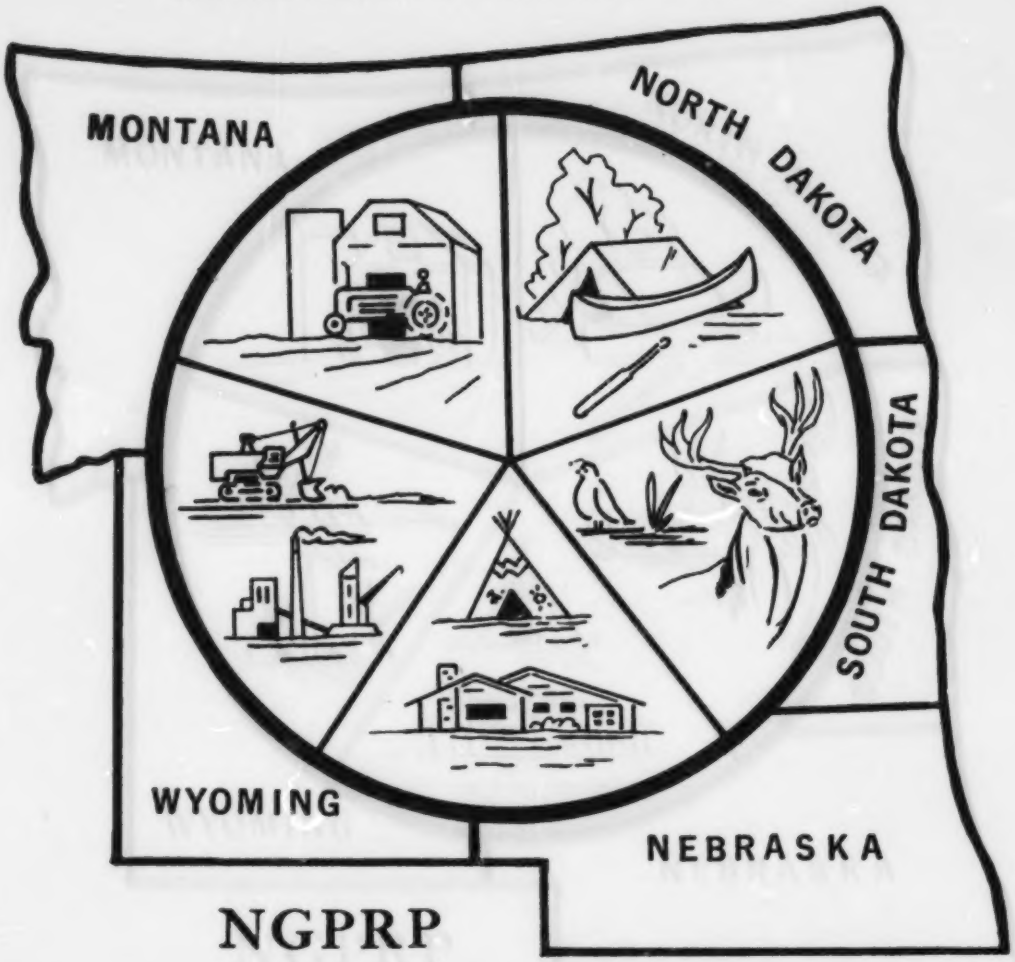

MONTANA
NEBRASKA
NORTH DAKOTA
SOUTH DAKOTA
WYOMING
ENVIRONMENTAL PROTECTION AGENCY
DEPARTMENT OF AGRICULTURE
DEPARTMENT OF INTERIOR

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NORTHERN GREAT PLAINS RESOURCES PROGRAM

SURFACE RESOURCES WORK GROUP - CONSTRAINTS

DISCUSSION DRAFT

MARCH 1974

THIS REPORT WAS PREPARED PURSUANT TO A DIRECTIVE DATED OCTOBER 23, 1973, FROM THE PROGRAM MANAGER, NORTHERN GREAT PLAINS RESOURCES PROGRAM. PUBLICATION OF THE FINDINGS AND RECOMMENDATIONS HEREIN SHOULD NOT BE CONSTRUED AS REPRESENTING EITHER THE APPROVAL OR DISAPPROVAL OF THE SECRETARY OF THE INTERIOR, THE SECRETARY OF AGRICULTURE, THE ADMINISTRATOR OF THE ENVIRONMENTAL PROTECTION AGENCY, OR THE STATES OF MONTANA, NEBRASKA, NORTH DAKOTA, SOUTH DAKOTA, AND WYOMING. THE PURPOSE OF THIS REPORT IS TO PROVIDE INFORMATION AND ASSISTANCE TO THE PROGRAM MANAGEMENT TEAM IN THE PREPARATION OF THE DRAFT INTERIM REPORT ON THE NORTHERN GREAT PLAINS RESOURCES PROGRAM. THE PROGRAM MANAGEMENT TEAM IS RELEASING THIS DRAFT FOR PUBLIC USE WITHOUT CORRECTING INCONSISTENCIES OR REWRITING BECAUSE THE DELAY REQUIRED TO ACCOMPLISH THIS TASK WOULD DELAY THE TIMELY ISSUANCE OF THE REPORTS.

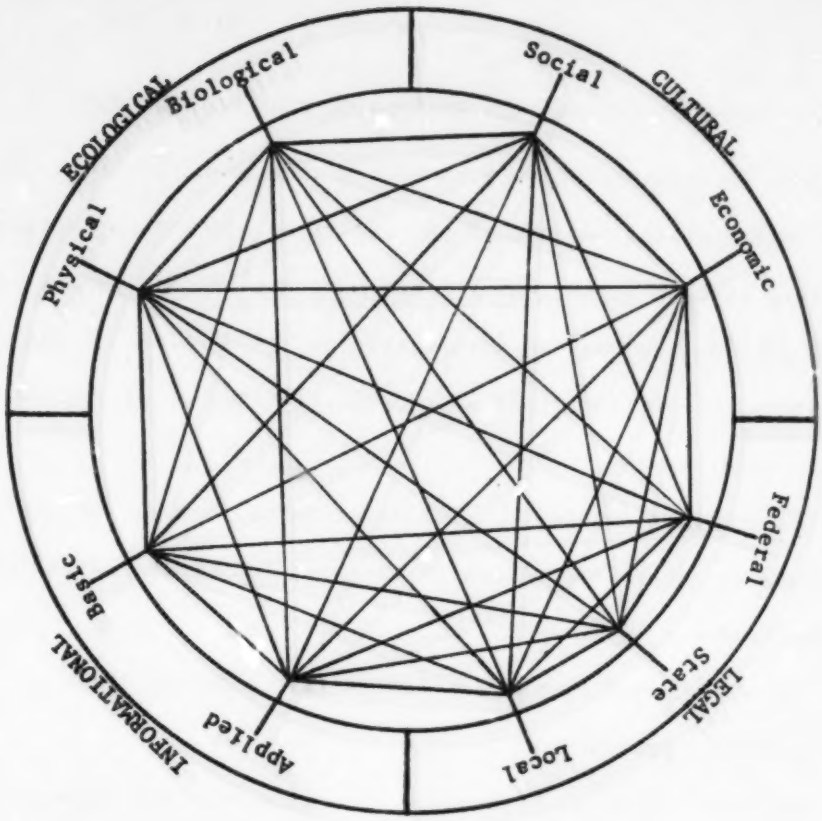
SURFACE RESOURCES CONSTRAINTS RELATED TO COAL DEVELOPMENT

Certain constraints operate to affect coal development in the Northern Great Plains because of the resulting effects on surface resources. In that sense, and for the purposes of this report, a constraint is defined as: an authority, law, regulation, condition, circumstance, or attitude that suppresses, limits, or represses an action to some degree.

The constraints imposed on coal development, because of considerations to surface resources in the Northern Great Plains, can be categorized as:

1. Legal--imposed by man-instituted laws enforced through judicial process.
2. Cultural--imposed by society as a result of attitude, tradition, social and economic standards, personal "taste," and desires.
3. Ecological--imposed by, and subject to, the limitations of natural processes involving both physical and biological phenomena.
4. Informational--made necessary because of the lack of knowledge presently to cope with situations. This category has flexibility to adjust as new data are collected, analyzed, and interpreted.

These categories of constraints are really not discrete; they are interrelated and represent a continuum of "pieces" all interacting. The web may be illustrated thusly:



This section on constraints does not purport an all-inclusive or exhaustive treatment. It would be presumptuous for a group of natural resource oriented personnel to attempt a searching review of all conceivable constraints. Such an undertaking, if needed, should be conducted by a work group embodying all facets of expertise required. This work group proposed the creation of such a group for that purpose.

Legal constraints consist of federal, state, and local statutes, regulations, and ordinances.

Among some of the important federal constraints are these Acts, of which pertinent provisions are cited:

Public Law 91-190, Title I, Sec. 102, Jan. 1, 1970, more commonly known as the National Environmental Policy Act contains these provisions:

All agencies of the Federal Government shall:

(A) utilize a systematic, interdisciplinary approach which will insure the integrated use of the natural and social sciences and the environmental design arts in planning and in decisionmaking which may have an impact on man's environment;

(B) identify and develop methods and procedures, in consultation with the Council Environmental Quality established by subchapter II of this chapter, which will insure that presently unquantified environmental amenities and values may be given appropriate consideration in decisionmaking along with economic and technical considerations;

(C) include in every recommendation or report on proposals for legislation and other major Federal actions significantly affecting the quality of the human environment, a detailed statement by the responsible official on--

(i) the environmental impact of the proposed action,

(ii) any adverse environmental effects which cannot be avoided should the proposal be implemented,

(iii) alternatives to the proposed action,

(iv) the relationship between local short-term uses of man's environment and the maintenance and enhancement of long-term productivity, and

(v) any irreversible and irretrievable commitments of resources which would be involved in the proposed action should it be implemented.

Prior to making any detailed statement, the responsible Federal official shall consult with and obtain the comments of any Federal agency which has jurisdiction by law or special expertise with respect to any environmental impact involved. Copies of such statement and the comments and views of the appropriate Federal, State, and local agencies, which are authorized to develop and enforce environmental standards, shall be made available to the President, the Council on Environmental Quality and to the public as provided by section 552 of Title 5, and shall accompany the proposal through the existing agency review processes;

(D) study, develop, and describe appropriate alternatives to recommended courses of action in any proposal which involves unresolved conflicts concerning alternative uses of available resources;

(E) recognize the worldwide and long-range character of environmental problems and, where consistent with the foreign policy of the United States, lend appropriate support to initiatives, resolutions, and programs designed to maximize international cooperation in anticipating and preventing a decline in the quality of mankind's world environment;

(F) make available to States, counties, municipalities, institutions, and individuals, advice and information useful in restoring, maintaining, and enhancing the quality of the environment;

(G) initiate and utilize ecological information in the planning and development of resource-oriented projects; and

(H) assist the Council on Environmental Quality established by subchapter II of this chapter.

Additional stipulations contained in Executive Order No. 11472, May 29, 1969, amplify that plans and programs may include, but are not limited "to, those for or affecting: (1) Development, restoration, and preservation of the beauty of the countryside, urban and suburban areas, water resources, wild rivers, scenic roads, parkways and highways, (2) the protection and appropriate management of scenic or primitive areas, natural wonders, historic sites, and recreation areas, (3) the management of Federal land and water resources, including fish and wildlife, to enhance natural beauty and recreational opportunities consistent with other essential uses, (4) cooperation with the States and their local subdivisions and private organizations and individuals in areas of mutual interest, (5) interstate arrangements, including Federal participation where authorized and necessary, and (6) leadership in a nationwide recreation and beautification effort."

The Wilderness Act, P.L. 88-577, provides that,

(a) In order to assure that an increasing population, accompanied by expanding settlement and growing mechanization, does not occupy and modify all areas within the United States and its possessions, leaving no lands designated for preservation and protection in their natural condition, it is hereby declared to be the policy of the Congress to secure for the American people of present and future generations the benefits of an enduring resource of wilderness. For this purpose there is hereby established a National Wilderness Preservation System to be composed of federally owned areas designated by Congress as "wilderness areas", and these shall be administered for the use and enjoyment of the American people in such manner as will leave them unimpaired for future use and enjoyment as wilderness, and so as to provide for the protection of these areas.

(b) ...

(c) A wilderness, in contrast with those areas where man and his own works dominate the landscape, is hereby recognized as an area where the earth and its community of life are untrammeled by man, where man himself is a visitor who does not remain. An area of wilderness is further defined to mean in this chapter an area of undeveloped Federal land retaining its primeval character and influence, without permanent improvements or human habitation, which is protected and managed so as to preserve its natural

conditions and which (1) generally appears to have been affected primarily by the forces of nature, with the imprint of man's work substantially unnoticeable; (2) has outstanding opportunities for solitude or a primitive and unconfined type of recreation; (3) has at least five thousand acres of land or is of sufficient size as to make practicable its preservation and use in an unimpaired condition; and (4) may also contain ecological, geological, or other features of scientific, educational, scenic, or historical value. Pub.L. 88-577, Sec. 2, Sept. 3, 1964, 78 Stat. 890.

An important provision related to coal or other mineral development in the Northern Great Plains is this provision:

> (3) Notwithstanding any other provisions of this chapter, until midnight December 31,1983, the United States mining laws and all laws pertaining to mineral leasing shall, to the same extent as applicable prior to September 3, 1964, extend to those national forest lands designated by this chapter as "wilderness areas"; subject, however, to such reasonable regulations governing ingress and egress as may be prescribed by the Secretary of Agriculture consistent with the use of the land for mineral location and development and exploration, drilling, and production, and use of land for transmission lines, water-lines, telephone lines, or facilities necessary in exploring, drilling, producing, mining, and processing operations, including where essential the use of mechanized ground or air equipment and restoration as near as practicable of the surface of the land disturbed in performing prospecting, location, and, in oil and gas leasing, discovery work, exploration, drilling, and production, as soon as they have served their purpose. Mining locations lying within the boundaries of said wilderness areas shall be held and used solely for mining or processing operations and uses reasonably incident thereto; and hereafter, subject to valid existing rights, all patents issued under the mining laws of the United States affecting national forest lands designated by this chapter as wilderness areas shall convey title to the mineral deposits within the claim, together with the right to cut and use so much of the mature timber therefrom as may be needed in the extraction, removal, and beneficiation of the mineral deposits, if needed timber is

not otherwise reasonably available, and if the timber is cut under sound principles of forest management as defined by the national forest rules and regulations, but each such patent shall reserve to the United States all title in or to the surface of the lands and products thereof, and no use of the surface of the claim or the resources therefrom not reasonably required for carrying on mining or prospecting shall be allowed except as otherwise expressly provided in this chapter: Provided, That, unless hereafter specifically authorized, no patent with wilderness areas designated by this chapter shall issue after December 31, 1983. Mining claims located after September 3, 1964 within the boundaries of wilderness areas designated by this chapter shall create no rights in excess of those rights which may be patented under the provisions of this subsection. Mineral leases, permits, and licenses covering lands within national forest wilderness areas designated by this chapter shall contain such reasonable stipulations as may be prescribed by the Secretary of Agriculture for the protection of the wilderness character of the land consistent with the use of the land for the purposes for which they are leased, permitted, or licensed. Subject to valid rights then existing, effective January 1, 1984, the minerals in lands designated by this chapter as wilderness areas are withdrawn from all forms of appropriation under the mining laws and from disposition under all laws pertaining to mineral leasing and all amendments thereto.

The Department of Transportation Act (Public Law 89-670) contains this provision:

> Maintenance and enhancement of natural beauty of land traversed by transportation lines
>
> (f) It is hereby declared to be the national policy that special effort should be made to preserve the natural beauty of the countryside and public park and recreation lands, wildlife and waterfowl refuges, and historic sites. The Secretary of Transportation shall cooperate and consult with the Secretaries of the Interior, Housing and Urban Development, and Agriculture, and with the States in developing transportation plans and programs that include measures to maintain or enhance the natural beauty of the lands traversed. After August 23, 1968, the Secretary shall not approve any program or project which requires the use of any publicly owned land from a public park, recreation area, or wildlife and waterfowl refuge of national, State, or local significance as determined by the Federal, State, or local officials having jurisdiction thereof, or any land from an historic site of national, State, or local significance as so determined by such officials unless (1) there is no feasible and prudent alternative to the use of such land, and (2) such program includes all possible planning to minimize harm to such park, recreational area, wildlife and waterfowl refuge, or historic site resulting from such use.
> (49 USC, Sec. 1653)

Public Law 90-542, established the national wild and scenic rivers system. The Congressional declaration of policy reads:

> It is hereby declared to be the policy of the United States that certain selected rivers of the Nation which, with their immediate environments, possess outstandingly remarkable scenic, recreational, geologic, fish and wildlife, historic, cultural, or other similar values, shall be preserved in free-flowing condition, and that they and their immediate environments shall be protected for the benefit and enjoyment of present and future generations. The Congress declares that the established national policy of dam and other construction at appropriate sections of the rivers of the United States needs to be complemented by a policy that would preserve other selected rivers or sections thereof in their free-flowing condition to protect the water quality of such rivers and to fulfill other vital national conservation purposes.
>
> Pub.L. 90-542, Sec. 1(b), Oct. 2, 1968, 82 Stat. 906.

The Act further provides that:

> Every wild, scenic or recreational river in its free-flowing condition, or upon restoration to this condition, shall be considered eligible for inclusion in the national wild and scenic rivers system and, if included, shall be classified, designated, and administered as one of the following:
>
> (1) Wild river areas--Those rivers or sections of rivers that are free of impoundments and generally inaccessible except by trail, with watersheds or shorelines essentially primitive and waters unpolluted. These represent vestiges of primitive America.

(2) Scenic river areas--Those rivers or sections of rivers that are free of impoundments, with shorelines or watersheds still largely primitive and shorelines largely undeveloped, but accessible in places by roads.

(3) Recreational river areas--Those rivers or sections of rivers that are readily accessible by road or railroad, that may have some development along their shorelines, and that may have undergone some impoundment or diversion in the past.

Pub.L. 90-542, Sec. 2, Oct. 2, 1968, 82 Stat. 906.

Public Law 89-665 provides for the preservation of objects significant to the culture and heritage of the United States. This is provided thusly:

The Secretary of the Interior is authorized--

to expand and maintain a national register of districts, sites, buildings, structures, and objects significant in American history, architecture, archeology, and culture, hereinafter referred to as the National Register, and to grant funds to States for the purpose of preparing comprehensive statewide historic surveys and plans, in accordance with criteria established by the Secretary, for the preservation, acquisition, and development of such properties.

The term "historic preservation" includes the protection, rehabilitation, restoration, and reconstruction of districts, sites, buildings, structures, and objects significant in American history, architecture, archeology, or culture.

Pub.L. 89-665, Title I, Sec. 101, Oct. 15, 1966, 80 Stat. 915.

Protection and Enhancement of the Cultural Environment Executive Order No. 11593, May 13, 1971 (16 USAC, Sec. 470).

In furtherance of the purposes and policies of the National Environmental Policy Act of 1969 (83 Stat. 852, 42 U.S.C. 4321 et seq.) [section 4321 et seq. of Title 42, The Public Health and Welfare], the National Historic Preservation Act of 1966 (80 Stat. 915, 16 U.S.C. 470 et seq.) [section 470 et seq. of this title], the Historic Sites Act of 1935 (49 Stat. 666, 16 U.S.C. 461 et seq.) [section 461 et seq. of this title], and the Antiquities Act of 1906 (34 Stat. 225, 16 U.S.C. 431 et seq.) [section 431 et seq. of this title], it is ordered as follows:

Section 1. Policy. The Federal Government shall provide leadership in preserving, restoring and maintaining the historic and cultural environment of the Nation. Agencies of the executive branch of the Government (hereinafter referred to as "Federal agencies") shall (1) administer the cultural properties under their control in a spirit of stewardship and trusteeship for future generations, (2) initiate measures necessary to direct their policies, plans, and programs in such a way that federally owned sites, structures, and objects of historical, architectural or archaeological significance are preserved, restored and maintained for the inspiration and benefit of the people, and (3), in consultation with the Advisory Council on Historic Preservation (16 U.S.C. 470i) [section 470i of this title], institute procedures to assure that Federal plans and programs contribute to the preservation and enhancement of non-federally owned sites, structures and objects of historical, architectural or archaeological significance. (16 U.S.C., Sec. 470)

Numerous statutes exist in relation to the protection and preservation of birds, game, and fish. To cite a few examples should suffice to illustrate the national concern.

> Whoever, within the United States or any place subject to the jurisdiction thereof, without being permitted to do so as provided in sections 668 to 668d of this title, shall knowingly, or with wanton disregard for the consequences of his act take, possess, sell, purchase barter, offer to sell, purchase or barter, transport, export or import, at any time or in any manner, any bald eagle commonly known as the American eagle, or any golden eagle, alive or dead, or any part, nest, or egg thereof of the foregoing eagles, or whoever violates any permit or regulation issued pursuant to sections 668 to 668d of this title, shall be fined nor more than $5,000 or imprisoned not more than one year or both: Provided, That in the case of a second or subsequent conviction for a violation of this section committed after October 23, 1972, such person shall be fined not more than $10,000 or imprisoned not more than two years, or both.
>
> As amended Oct. 24, 1962, Pub.L. 87-884, 76 Stat. 1246; October 23, 1972, Pub.L. 92-535, Sec. 1, 86 Stat. 1064.

And further:

> (a) The Congress finds and declares that one of the unfortunate consequences of growth and development in the United States has been the extermination of some native species of fish and wildlife; that serious losses in other species of native wild animals with educational, historical, recreational, and scientific

value have occurred and are occurring; and that the United States has pledged itself, pursuant to migratory bird treaties with Canada and Mexico and the Convention on Nature Protection and Wildlife Preservation in the Western Hemisphere, to conserve and protect, where practicable, the various species of native fish and wildlife, including game and nongame migratory birds, that are threatened with extinction. The purposes of this Act are to provide a program for the conservation, protection, restoration, and propagation of selected species of native fish and wildlife, including migratory birds, that are threatened with extinction.

(b) It is further declared to be the policy of Congress that the Secretary of the Interior, the Secretary of Agriculture, and the Secretary of Defense, together with the heads of bureaus, agencies, and services within their departments, shall seek to protect species of native fish and wildlife, including migratory birds, that are threatened with extinction, and, insofar as is practicable and consistent with the primary purposes of such bureaus, agencies, and services, shall preserve the habitats of such threatened species on lands under their jurisdiction.

(c) A species of native fish and wildlife shall be regarded as threatened with extinction whenever the Secretary of the Interior finds, after consultation with the affected States, that its existence is endangered because its habitat is threatened with destruction, drastic modification, or severe curtailment, or because of overexploitation, disease, predation, or because of other factors,

and that its survival requires assistance. In addition to consulting with the States, the Secretary shall, from time to time, seek the advice and recommendations of interested persons and organizations including, but not limited to, ornithologists, ichthyologists, ecologists, herpetologists, and mammalogists. He shall publish in the Federal Register the names of the species of native fish and wildlife found to be threatened with extinction in accordance with this subsection.

(d) For the purpose of sections 668aa through 668cc of this title, the term "fish and wildlife" means any wild mammal, fish, wild bird, amphibian, reptile, mullusk, or crustacean.

Pub.L. 89-669, Sec. 1, Oct. 15, 1966, 80 Stat. 926, amended; Pub.L. 91-135, Sec. 12(a), (e), Dec. 5, 1969, 83 Stat. 282, 283. Deserving special consideration in connection with contemplated mineral developments is the following provision contained in P. L. 91-135:

A species or subspecies of fish or wildlife shall be deemed to be threatened with worldwide extinction whenever the Secretary determines, based on the best scienfific and commercial data available to him and after consultation, in cooperation with the Secretary of State, with the foreign country or countries in which such fish or wildlife are normally found and, to the extent practicable, with interested persons and organizations and other interested Federal agencies, that the continued existence of such species or subspecies of fish or wildlife is, in the judgment of the Secretary, endangered due to any of the following factors: (1) the destruction, drastic modification, or severe curtailment, or the threatened destruction, drastic modification, or severe

curtailment, of its habitat, or (2) its overutilization for commercial or sporting purposes, or (3) the effect on it of disease or predation, or (4) other natural or man-made factors affecting its continued existence. After making such determination, the Secretary shall promulgate and from time to time he may revise, by regulation, a list in the Federal Register of such fish or wildlife by scientific, common, and commercial name or names, together with his determination. The Secretary shall at least once every five years conduct a thorough review of any such list to determine what, if any, changes have occurred relative to the continued existence of the species or subspecies of fish or wildlife then on the list and to determine whether such fish or wildlife continue to be threatened with wordwide extinction. Upon completion of such review, he shall take appropriate action consistent with the purposes of this Act. The Secretary shall, upon the request of any interested person, also conduct such review of any particular listed species or subspecies at any other time if he finds and publishes his finding that such person has presented substantial evidence to warrant such a review.

Public Law 90-543, enacted in October 1968, is known as the "National Trails System Act," provides for the establishment of trails primarily near the urban areas of the nation, and, secondarily, within established scenic areas more remotely located. Sec. 3 (b) provides:

> National scenic trails, established as provided in section 5 of this Act, which will be extended trails so located as to provide for maximum outdoor recreation potential and for the conservation and enjoyment of the nationally significant scenic, historic, natural, or cultural qualities of the areas through which such trails may pass.

Sec. 7 further provides:

> The following routes shall be studied in accordance with objectives outlined:
>
> (1) Continental Divide Trail, a three-thousand-one-hundred-mile trail extending from near the Mexican border in southwestern New Mexico northward generally along the Continental Divide to the Canadian border in Glacier National Park.
>
> (4) Lewis and Clark Trail, from Wood River, Illinois, to the Pacific Ocean in Oregon, following both the outbound and inbound routes of the Lewis and Clark Expedition.
>
> (8) Oregon Trail, from Independence, Missouri, approximately two thousand miles to near Fort Vancouver, Washington.
>
> (11) Mormon Trail, extending from Nauvoo, Illinois, to Salt Lake City, Utah, through the States of Iowa, Nebraska, and Wyoming.

Designation of any or all of these trails as members of the National Trails System could effectively constrain coal developments in parts of the Northern Great Plains.

Public Law 92-500 of 1972 amended the Federal Water Pollution Control Act in Sec. 101 in part as follows:

> Sec. 101 (a) The objective of this Act is to restore and maintain the chemical, physical, and biological integrity of the Nation's water. In order to achieve this objective it is hereby declared that, consistent with the provisions of this Act--
>
> (1) it is the national goal that the discharge of pollutants into the navigable waters be eliminated by 1985;
>
> (2) it is the national goal that wherever attainable, an interim goal of water quality which provides for the protection and propagation of fish, shellfish, and wildlife and provides for recreation in and on the water be achieved by July 1, 1983;
>
> (3) it is the national policy that the discharge of toxic pollutants in toxic amounts be prohibited; . . .
>
> (b) It is the policy of the Congress to recognize, preserve, and protect the primary responsibilities and rights of States to prevent, reduce, and eliminate pollution, to plan the development and use (including restoration, preservation, and enhancement) of land and water resources, and to consult with the Administrator in the exercise of his authority under this act. . . . .

These provisions clearly establish goals and constraints in land uses that relate to water pollution.

Public Law 91-453, enacted in October 1970, amended Sec. 14 of the Urban Mass Transportation Act of 1964 to read in part as follows:

Sec. 14 (a) It is hereby declared to be the national policy that special effort shall be made to preserve the natural beauty of the countryside, public park and recreation lands, wildlife and waterfowl refuges, and important historical and cultural assets, in the planning, designing, and construction of urban mass transportation projects for which Federal assistance is provided pursuant to section 3 of this Act. In implementing this policy the Secretary shall cooperate and consult with the Secretaries of Agriculture, Health, Education, and Welfare, Housing and Urban Development, and Interior, and with the Council on Environmental Quality with regard to each project that may have a substantial impact on the environment.

(b) The Secretary shall review each transcript of hearing submitted pursuant to section 3 (d) to assure that an adequate opportunity was afforded for the presentation of views by all parties with a significant economic, social, or environmental interest, and that the project application includes a detailed statement on --

(1) the environmental impact of the proposed project,

(2) any adverse environmental effects which cannot be avoided should the proposal be implemented,

(3) alternatives to the proposed project, and

(4) any irreversible and irretrievable impact on the environment which may be involved in the proposed project should it be implemented.

These provisions are aimed specifically at environmental protection.

The most relevant state laws constraining coal development in consideration of surface resources are those relating to prospecting, mining, and reclamation. Even between the states represented in the NGPRP, the statutory requirements differ substantially.

In Montana, "The Strip Mined Coal Conservation Act" of 1973 vests in the Department of State Lands the authority to review strip mining plans and either approve or disapprove such plans for the purpose of preventing waste. The Act further provides that no operator may engage in strip mining without having first obtained approval of a strip mining plan from the Department. Rules and regulations regarding the contents of the strip mining plan are promulgated in the Montana Administrative Code 26-48.39.

Montana's 1973 "Strip Mining and Reclamation Act contains stringent requirements for the prospecting and strip mining of coal, clay, phosphate rock, and uranium. Specific provisions or portions thereof include:

> Sec. 9 (1). An application for a prospecting or strip mining permit shall not be approved by the department if there is found on the basis of the information set forth in the application, an on-site inspection, and an evaluation of the operation by the department that the requirements of the act or rules will not be observed or that the proposed method of operation, backfilling, grading, highwall reduction, topsoiling, revegetation, or reclamation of the affected area cannot be carried out consistent with the purpose of this act.

(2) The Department shall not approve the application for prospecting or strip mining permit where the area of land described in the application includes land having special, exceptional, critical, or unique characteristics, or that mining or prospecting on that area would adversely affect the use, enjoyment, or fundamental character of neighboring land having special, exceptional, critical, or unique characteristics. For the purposes of this Act, land is defined as having such characteristics if it possesses special, exceptional, critical, or unique:

(a) biological productivity, the loss of which would jeopordize certain species of wildlife or domestic stock; or

(b) ecological fragility, in the sense that the land, once adversely affected, could not return to its former ecological role in the reasonable foreseeable future; or

(c) ecological importance, in the sense that the particular land has such a strong influence on the total ecosystem of which it is a part that even temporary effects felt by it could precipitate a system-wide reaction of unpredictable scope or dimensions; or

(d) scenic, historic, archeologic, topographic, geologic, ethnologic, scientific, cultural, or recreational significance. In applying this subsection, particular attention should be paid to the inadequate preservation previously accorded Plains Indian history and culture. . . .

Sec. 10 (1). As rapidly, completely, and effectively as the most modern technology and the most advanced state of the art will allow, each operator granted a permit under this act, shall reclaim and revegetate the land affected by his operation. Under the provisions of this act and rules adopted by the board, an operator shall prepare and carry out a method of operation, plan of grading, backfilling, highwall reduction, topsoiling and a reclamation plan for the area of land affected by his operation. . . .

Sec. 11 (1). Area strip mining, a method of operation which does not produce a bench or fill bench, is required. All highwalls must be reduced and the steepest slope of the reduced highwall shall be no greater than twenty (20) degrees from the horizontal. Highwall reduction shall be commenced at or beyond the top of the highwall and sloped to the graded spoil bank. Reduction, backfilling, and grading shall eliminate all highwalls and spoil peaks. The area of land affected shall be restored to the approximate original contour of the land.

(3) All available topsoil shall be removed in a separate layer, guarded from erosion and pollution, kept in such a condition that it can sustain vegetation of at least the quality and variety it sustained prior to removal, and returned as the top layer after the operation has been backfilled and graded; provided that the operator shall accord substantially the same treatment to any subsurface deposit of material that is capable, as determined by the department, of supporting surface vegetation virtually as well as the present topsoil.

Sec. 12. After the operation has been backfilled, graded, topsoiled, and approved by the department, the operator shall prepare the soil and plant such legumes, grasses, shrubs, and trees upon the area of land affected as are necessary to provide a suitable permanent diverse vegetative cover capable of:

(a) feeding and withstanding grazing pressure from a quantity and mixture of wildlife and livestock at least comparable to that which the land could have sustained prior to the operation;

(b) regenerating under the natural conditions prevailing at the site, including occasional drought, heavy snowfalls, and strong winds; and

(c) preventing soil erosion to the extent achieved prior to the operation.

One additional statute is the 1974 Montana Strip Mining Siting Act, which amplifies Sec. 9 of the Strip Mine and Reclamation Act (1973). It requires a siting permit with respect to mines and supporting facilities.

Chapter 38-14 of North Dakota's statute pertaining to "Reclamation of Strip-Mined Lands" contains these important provisions:

38-14-01. Declaration of Policy. It is declared to be the policy of this state to provide, after surface mining operations are completed, for reclamation of affected lands to encourage productive use including but not limited to: the planting of forests; the seeding of grasses and legumes for grazing purposes; the planting of crops for harvest; the enhancement of wildlife and aquatic resources; the establishment of recreational, home, and industrial sites; and for the conservation, development, management and appropriate use of all the natural resources of such areas for compatible multiple purposes; to aid in maintaining or improving the tax base; and protecting the health, safety and general welfare of the people, as well as the natural beauty and aesthetic values, in the affected areas of this state. SOURCE: S. L. 1969, ch. 332, § 1.

38-14-03. Necessity of License. It shall be unlawful after January 1, 1970, for any operator to engage in surface mining, in an area where the overburden shall exceed ten feet in depth, without first obtaining from the commission a permit so to do, in such form as is hereinafter provided. SOURCE: S. L. 1969, ch. 332, § 3.

38-14-05. Duties of Operator. Every operator to whom a permit is issued pursuant to the provisions of this chapter may engage in surface mining during the permit term upon the lands described in the permit upon the performance of and subject to the following requirements with respect to such lands:

1. On all affected land which is to be used for crops, including hay, the operator shall grade peaks and ridges to a slope of not more than twenty percent and fill valleys in such manner that the area can be traversed with farm machinery reasonably necessary for such use.

2. On all affected land which is to be seeded to pasture, the operator shall strike off all peaks or ridges to a minimum width of thirty-five feet at the top.

3. All ridges and peaks to be afforested shall be struck off to a minimum width of thirty-five feet at the top. On all affected land which is to be afforested, the operator shall construct access roads through the areas, such roads to be not less than twenty-five feet width and constructed so that the right-of-way limits are not more than four hundred forty yards apart, with road grades not to exceed twenty percent. . . .

9. The operator shall sow, set out, or plant upon the affected land described in the reclamation plan and map or maps, seeds, plants, cuttings of trees, shrubs, grasses, or legumes as shall be approved in writing by the commission.

The following rules and regulations for surface mining and land reclamation were adopted by the South Dakota State Conservation Commission pursuant to S.D.C.L. 45-6A-1971 Pocket Supplement.

1. The Commission will require that all surface mining operators removing more than 1,000 tons of material in 12 successive months, from each operation within South Dakota, shall apply for a permit to carry out surface mining in accordance with permit and reclamation form provided by the Commission.

2. A plan for reclamation of the surface mined area shall accompany the application for a permit.

3. The plan for reclamation of the surface mined area shall set forth facts pertaining to: land use, soil type, contour basis of mining, where slopes are 5 percent or over; plans for water detention or disposal; isolating and or burying all waste, boulders, and toxic materials, replacement of topsoil, and seeding of grass, shrubs, or trees, in accordance with land capabilities and the resource area where mining operations are to be carried out.

Specific rules applying to land reclamation are:

1. The degree to which surface mined areas will be reclaimed shall be in accordance with Soil Conservation Service land capability classification and the potential future use of the area.

2. All toxic and other material that have a damaging effect upon ground and surface waters, fish and wildlife, public health, safety, and the total environment must be isolated.

3. Surface mined areas will be reclaimed and shaped to control erosion, provide for vegetation, to eliminate hazards to domestic animals and wildlife, and to protect public health, safety, environment, and provide for future beneficial use.

4. Topsoil shall be removed and stockpiled separately from the balance of overburden. When the overburden has been replaced in accordance with the plan of reclamation, topsoil will be replaced evenly over the reclaimed area.

5. Revegetation of the total area disturbed in the surface mining process will be in accordance with agronomic and forestry recommendations by the Commission. Such recommendations will be secured from South Dakota State University, U.S. Soil Conservation Service, U.S. Forest Service, State Forester, and the U.S. Agricultural Research Service and other agencies.

The Wyoming Environmental Quality Act of 1973 establishes more stringent regulations concerning the surface extraction of minerals and subsequent reclamation. Pertinent provisions applicable to surface resources include:

§ 35-502.20. (a) No mining operation or operation by which solid minerals are intended to be extracted from the earth shall be commenced after the effective date of the act (§§ 35-502.1 to 35-502.56), except in accordance with the requirements hereof.

§ 35-502.21. (a) The council shall, upon recommendation by the advisory board, establish rules and regulations pursuant to the following reclamation standards for the affected areas, including but not limited to:

(i) The highest previous use of the affected lands, the surrounding terrain and natural vegetation, surface and subsurface flowing or stationary water bodies, wildlife and aquatic habitat and resources, and acceptable uses after reclamation including the utility and capacity of the reclaimed lands to support such uses.

(ii) Backfilling, regrading or recontouring to assure the reclamation of the land to a use at least equal to its highest previous use.

(iii) A time schedule encouraging the earliest possible reclamation program consistent with the orderly and economic development of the mining property.

(iv) Revegetation of affected lands including species to be used, methods of planting and other details necessary to assure the development of a vegetative cover consistent with the surrounding terrain and the highest prior use standards set out in subparagraph (i) of this paragraph.

(v) Stockpiling, preservation and reuse of topsoil for revegetation, unless it can be demonstrated to the satisfaction of the administrator that other methods of reclamation or types of soil are superior.

(vi) Prevention of pollution of waters of the state from mining operations, substantial erosion, sedimentation, landslides, accumulation and discharge of acid water, and flooding, both during and after mining and reclamation.

(vii) In administering established rules and regulations on such standards the administrator and advisory board shall consider all the facts and circumstances bearing upon any reclamation plan. In consideration of reclamation plans for any mining operator that is presently being conducted in the state under a permit issued by the state land commission under the "Open Cut Land Reclamation Act of 1969," particular attention shall be paid to:

(A) The social and economic value of the product mined;

(B) The technological availability for economic feasibility of reclaiming the affected area.

Further provisions include the requirement of a reclamation plan dealing with the extent to which the mining operation will disturb, change, or deface the lands to be affected, the proposed future use or uses and the plan whereby the operator will reclaim the affected lands to the proposed future use or uses. The reclamation plan shall include this element in addition to others:

> The proposed method of separating topsoil, subsoil, and spoil piled, protecting and conserving them from wind and water erosion before reclamation begins by planting a quick growing cover or other acceptable methods, and the proposed method of preserving topsoil free of acid or toxic materials, as well as the manner in which topsoil shall be replaced. If topsoil is virtually non-existent or is not capable of sustaining vegetation, then the method of removing, segregating and preserving in a like manner subsoil which is better able to support vegetation. Spoil piles are to be kept separate and apart from topsoil. All piles are to be clearly marked so as to avoid confusion. If conditions do not permit the separation, conservation and replacement of topsoil or subsoil, a full explanation of such conditions shall be given and alternate procedures proposed.

The foregoing State statutory requirements show certain similarities, while simultaneously showing divergence in stringency. This is not unexpected, and will likely so remain until such time as a federal law is enacted that provides for minimum uniform standards.

Cultural constraints exist as a result of social attitudes, traditions, and economic trends. They evolve from considerations of:

1. Influence of development on scenery, recreation, or wilderness attributes and values;
2. Potential impacts on life-style changes;
3. Conflicts of economic opportunities versus economic losses;
4. Effects of developments on historic, archaeologic, and unique areas; and
5. Land ownership changes and uses.

Ecological constraints are imposed by natural processes and limitations of the environment, and involve climate, geology, soils, vegetation, and wildlife.

1. Climatic constraints
   a. Periodic severe drought.
   b. Severe summer thunder and hailstorms of high intensity.
   c. High wind velocities, duststorms, affect drought.
   d. Severe winters of low temperatures with little snow insulation on windswept areas.
2. Geology and soil constraints
   a. Toxic concentrations of sodium, leading to high sodium absorption ratios; and other elements--alkalinity, etc.
   b. Shallow topsoils of low productivity.
   c. Coarse-textured materials of low water-holding capacity.
   d. Soil instability and erodibility on slopes, leading to sedimentation, erosion channels, etc.

3. Vegetation

a. Very little, to nothing at all, is known about the physiological requirements of most native plant species on the Northern Great Plains.

b. Rare and endangered species need to be identified and ecologically quantified.

c. Availability of seed of native species is insufficient for rehabilitation, and is variable from year to year.

d. Detailed ecological data of species in areas to be mined is not, in all cases, available.

4. Wildlife

a. Effects of development on migration and feeding habits of wildlife species.

b. Carrying capacity effects due to development.

c. Influence of development on habitat quality.

d. How much development can be tolerated before serious danger of severely affecting wildlife populations?

e. Effect of development on open space and natural character of wildlife range.

Informational constraints may be a misnomer; more correctly, the paucity of knowledge or inadequate information about natural phenomena tend to hamper proper decisionmaking. Especially acute needs exist for additional information in the following areas:

1. Micro-organisms

   a. What role do micro-organisms play in the stabilization of disturbed sites?

   b. Need inventory of endogenous native micro-organisms in different soil types.

   c. Can micro-organisms be innoculated into a disturbed area, and will they be able to contribute to plant establishment?

   4. Will stockpiling of topsoil adversely affect micro-organism activity?

2. Ecosystems

   a. Basic data on the interrelations of ecosystem components are needed on site-specific areas to be developed.

   b. Need to develop rehabilitation guidelines that provide opportunity for reestablishment of ecosystems after development.

   c. What are the suitable alternatives to returning a disturbance to natural state?

   d. How much development can take place without seriously threatening the stability of an entire ecosystem?

3. Rehabilitation

a. Development of techniques and methods for acceptable rehabilitation after development.

b. Others--as cited above.

The foregoing listing of legal, cultural, ecological, and informational constraints is an array that is apt cause for concern in some quarters. They should not be viewed with trepidation. What is regarded a constraint today can change quickly. Laws, made by man, can be changed; cultural patterns and mores are subject to evolution; ecological constraints can be mitigated with broader understanding of environmental phenomena, coupled with improved technology; and informational gaps can be plugged by the accretion of needed knowledge. The crux of the matter rests upon the enlightened determination of resource needs and values and resultant trade-offs.